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NAVAL MEDICAL SURVEILLANCE REPORT

NMSR

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From the Population Health Director

CAPT Bruce K. Bohnker, MC, USN (FS)

The fall seemed subdued with the foliage change likely limited from damage due to Hurricane Isabel. The Hampton Roads winter is upon us, though spring can't be far away. In NEHC Population Health, we have been busy with a number of personnel changes. Ms. Anuli Ajene, MPH departed from surveillance epidemiology to work on a project in Africa dealing with HIV disease. CDR Rick Stoermann MC, USN left as clinical epidemiology department head. He will be missed, particularly for his efforts with the Population Health Navigator and the BUMED Population Health Integrated Product Team. We also welcome LCDR Gary Tetreault, MSC, USN, our new medical entomologist from EPMU2, and LCDR Annette Von Thun MC, USN in the Clinical Epidemiology Department from NH Okinawa.

NEHC Population Health hosted the Navy Epidemiology Board in October 2003, with leadership from CDR Scott Sherman MC, USN and CDR Mark Malakooti MC, USN. The group discussed many of the lessons learned from recent operations in Iraq, as well as other issues such as concerns about malaria after the outbreak in Liberia. We have initiatives for expanded analytical support for the Naval Safety Center and Naval Medical Center, Portsmouth, VA. We have put out message guidance on permethrin treatment for uniforms, and medical SITREPS on West Nile Virus and Leishmaniasis. My largest personal tasking has been ongoing support for the Department of the Navy (DoN) Integrated Product Team (IPT) on Fitness and Nutrition. A major NEHC responsibility, the proposal has matured into "Get Moving Navy" with a pilot site under way called "Oceana Dam Neck in Motion". Below is a copy of the proposed logo. This effort is driven by increasing concerns with obesity in our Naval population and is a focus area of the Health Promotion Team.

Several opportunities on the horizon are keeping the Population Health staff quite busy. The annual NEHC workshop will be 21-26 March in Chesapeake, VA. Please put that on your schedule. CAPT McGinnis is busy working the many details and has put together an outstanding program, with support from the entire Population Health staff. He is scheduled to retire 09 April 2004 with 31 years of active Navy service, and will be greatly missed. We are also busy supporting the upcoming deployment of Navy Medicine personnel to Iraq. NEHC will be sending two Forward Deployable Preventive Medicine Units (FDPMUs), as well as other personnel.

This promises to be a very busy year in the preventive medicine community. I encourage everyone to make Force Health Protection a personal issue each and every day so that we can continue to support the Greatest Naval Service in the World.

Navy Medical Surveillance Report

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Editorial: Experiences Of A Tobacco-Free Navy Exchange

Dave Reid, M.S., Naval Hospital Great Lakes, IL

Tobacco presents a heavy burden on the health of our military population. Tobacco related illness is costing millions of dollars that could otherwise be used for improved DoD/VA healthcare. The search for a tobacco-free population has led many people to desire policy change and intervention at the highest leadership level. Such discussions have included tobacco-free Navy Exchanges (NEXs), tobacco-free while in uniform, and tobacco-free ships such as the USS Theodore Roosevelt in 1996. This write-up describes the experiences and reflections on a policy decision to remove tobacco from a NEX store.

A new NEX store was opened for business 14 November 2000 on the Great Lakes Base with one unique difference; it did not sell any tobacco or alcohol products. For many, it felt like a victory had been won and that leadership was sending a strong message about its tobacco convictions. The decision also helped soothe public sentiment from an ethical standpoint.

The store remained tobacco-free until February 2003 when leadership decided to allow tobacco sales. Many of us would see this experience as a tremendous victory followed by a defeat. However, it appears to have been neither. Although quantitative data was not collected, there appeared to be no overt signs of tobacco-use reduction during this time period.

The base leadership specified two reasons for the policy reversal. The first reason was to keep sailors from wandering off base to purchase tobacco. Given the nature of our very young population, the nature of the surrounding neighborhood, and the nature of the base mission, this was understandable to most people, especially those of us who are parents. There was a concern about immediate safety and the efficiency of the base's training mission.

The second reason, was that the policy was perceived as a nuisance by staff. Low-cost tobacco was still available at the Navy Burkey Mall, approximately two miles from base. Sailors and family members with cars were "forced" to drive there and sailors without cars had to catch a cab, pay top-dollar at MWR clubs or at the closer civilian stores, or have cheap tobacco shipped to them. It became an area of resentment for many in the workforce without any obvious redeeming value.

It is interesting that we did not see any signs of tobacco use prevention through this policy. Why would this be so? In hindsight, there really was no reduction in the supply, no increase in the price, and therefore, presumably, no decrease in the quantity demanded. Although not actively merchandised, tobacco was still available on base through the MWR clubs but at premium price. Leadership reported that pizza delivery drivers were selling cartons of cigarettes out of the back of their cars. Tobacco was also available within walking distance in civilian stores. Cheap tobacco was available nearby at the Burkey Mall NEX. Additionally, cheap tobacco was being obtained through family members, through the mail from other countries, and even from other CONUS military stores for less than a dollar per pack with rebate coupons.

Follow-up interviews, questionnaires, and meetings reveal that people still felt tobacco use was tacitly condoned through smoke-breaks, elaborate gazebo-style smoke-decks, and staff smoking while in uniform. Surprisingly, personnel on both sides of the tobacco issue also expressed negativity towards taking away freedoms despite good intentions. The thoughts seemed similar to resistance to gun control legislation. An analogy mentioned by one O-6 Medical Officer was "you don't just get sailors to lose weight by removing hot dogs from the galley." When asked about the idea of a tobacco-free Navy, one sailor asked "what's next, sugar-free Navy"? Many other

analogies and concerns have made us stop and think.

Here is where I currently stand on the matter as the Base Health Promotion Chairman. Many people feel with good reason that tobacco resale is immoral. Yes, there are examples where policy decisions have reduced consumption. I do believe for example, that if it were impossible for sailors to obtain cigarettes anywhere in the world for less than $10 per pack the consumption would drop. There is overwhelming evidence convincing us that tobacco is a bad thing for many reasons.

What are Navy leaders supposed to do with this evidence? I think leadership should rightfully say "Tell me something I don't already know. What are we *doing* about it?" Tobacco is a tremendously complex societal problem. However, there are three primary classes of strategic social change tools available to prevention managers: policy, marketing, and education. Guidelines are available to explain the differences, and for deciding which of these tools, or combinations of these tools to use in various predicaments. I was interested to learn that policy is often not the solution. [1]

Our hope is still for a tobacco-free Navy. I now believe it will take expert knowledge of disciplines not historically used by Navy Medicine: public policy, anthropology, sociology, adult education, and marketing to name a few. I know that I need to learn more about these fields. I also need to humbly investigate all of my assumptions and notions about Navy tobacco-use causes and tobacco-use solutions. I believe that at a minimum I must talk face-to-face with sailors of all ranks before assuming to know anything of real-world application. Most of all, I now understand the tremendous complexity of this problem. Raising awareness of the appalling costs of tobacco is only a starting point. Leadership now needs prevention "experts" to become analytical experts in managing real-world complexity to effect social change.

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Shipboard Exposures to Airborne Lead

LCDR Francis Hall, MC, USNR
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Background

In the United States, between 0.5 and 1.5 million workers are exposed to lead annually in the work place (1). Effects at low levels include brain, kidney, gastro-intestinal distress, central nervous system effects, and reproductive abnormalities. In the US military, ship repair and renovation presents a high risk of significant lead exposure. The United States Coast Guard (USCG) operates a ship repair and renovation facility in Baltimore, Maryland. Overhaul operations on the ships involve paint removal, welding, and repainting in large areas of the vessel. Older ships may contain lead primer or paint, which must be removed. Shipyard workers, known as blasters and weld-

ers, have the most contact with these surfaces and have the potential for airborne inhalational or oral lead exposure. Blasters employ various work techniques to remove paint from the vessels. Welders typically perform work on bare metal hull using a variety of techniques.

We will examine the airborne lead samples for blasters and welders from 1991 and 2002/3 to determine if changes in work technique, equipment, and engineering modifications reduced the airborne lead levels.

Methods

Bulk Paint: Bulk lead paint could be found at any or all layers of the surface. Lead content in the bulk paints ranged from below 1% and up to 11.5% of weight as per manufacturers labels.

Process Description: Ship repair and renovation involves a process of blasting, to remove as much paint as possible, followed by welding, as necessary. Paint was removed manually with wire brushes, with a portable pneumatic needle gun chipper and/or pneumatic disk grinders, or blasted off with abrasives or high-pressure water. Some tools were equipped with local exhaust ventilation and others are not. Welding was subsequently done on a spectrum of surfaces ranging from fully painted to varying degrees of removed paint. In some circumstances, paint cannot be removed and welding is done on the paint.

Air Samples: Air samples from 1991 and 2002/3 were collected identically. Samples were taken from a variety of spaces on the ship while individuals performed paint removal, welding, or resurfacing of the ships for the entire workday. Samples were analyzed following the National Institute of Occupational Safety (NIOSH) Analytical Method 7082 (3).

Results

Figures 1 and 2 display the changes in job technique by year and the corresponding airborne lead levels.

Figure 1. Airborne Lead Levels by Paint Removal Technique

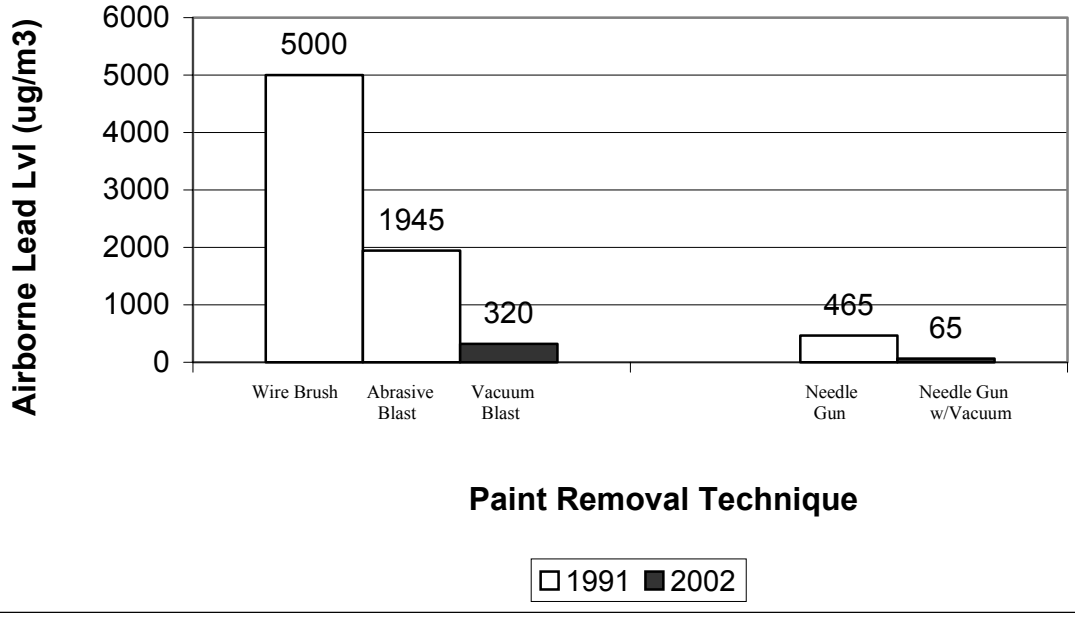
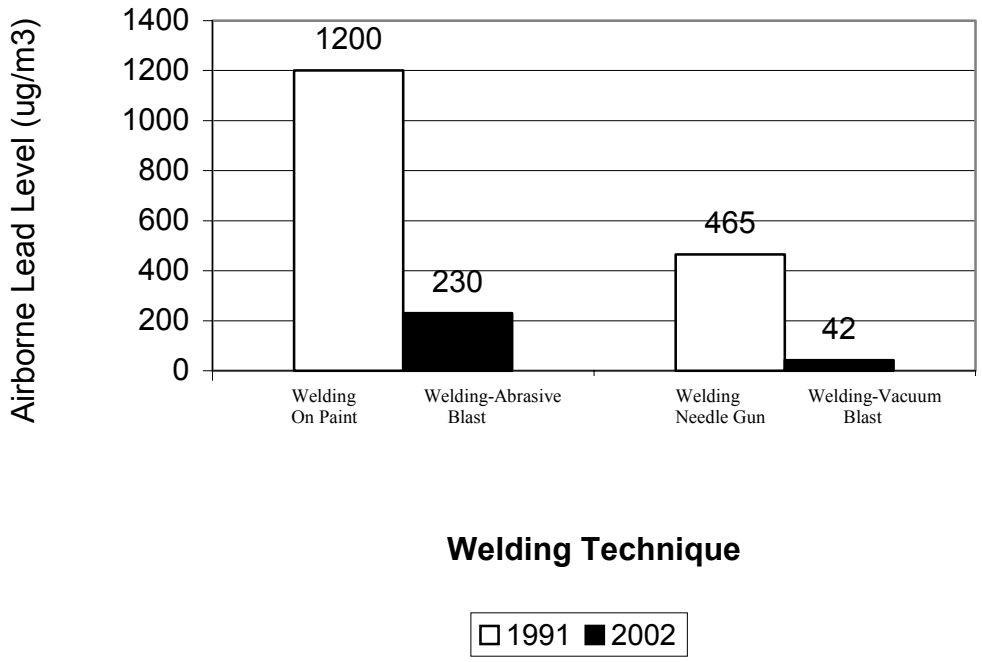


Figure 2. Airborne Lead Levels by Welding Technique



Discussion

Changes in all techniques greatly reduced the amount of airborne lead that a blaster or welder could be exposed to. This is significant because lead lacks a clear threshold for human health effects, has high absorption potential, and toxic risk can vary with age and nutritional status. For these reasons the medical/safety staff must rely on a systems approach to reduce lead risk from all lead related processes.

Recommendations include continued vigilance, the use of equipment with dust collection systems, and continued administrative controls.

Acknowledgements

I would like to thank Frances Cohen, Industrial Hygienist, at the Coast Guard Shipyard for her work in collection of the data, her ongoing support, and her consultation.

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Tuberculosis in the U.S. Navy And Marine Corps: A 3-Year Retrospective Analysis 2000-2002

HM2 (SW) Collin Bowman, USN, Wendi Suesz, MPH, Asha Riegodedios, MSPH,
CDR Mark Malakooti, MC, USN, Navy Environmental Health Center, Portsmouth, VA

Introduction

Tuberculosis (TB) continues to be a serious public health issue impacting Force Health Protection. Surveillance and prevention play a vital role in increasing readiness and maintaining health. The US Navy and USMC are at high risk set by their working conditions including closed air systems, close living quarters, and a significant amount of travel overseas. Thus, operational active duty Navy and Marine Corps personnel undergo TB screening and surveillance. This study presents a descriptive and evaluative analysis of TB screening surveillance in the Navy and Marine Corps.

Methods

Per BUMEDINST 6224.8, activities with medical department personnel and ships of the Military Sealift Command shall screen personnel for tuberculosis infection on a regular basis.[1] Regular screening may occur annually or every three years depending on risk of exposure as determined by duty type and location. Commands shall also prepare an annual summary report and submit to the cognizant Navy Environmental and Preventive Medicine Unit (NEPMU). Reports include: number of personnel at the command, number of Tuberculin Skin Tests (TST) placed, the number of positive TST's, the number of previously identified TST reactors and number of actual TB cases. The NEPMU's collect and analyze the data and, in turn, forward the reports to NEHC (Navy Environmental Health Center) for overall collation and review. This is separate from the urgent reporting of suspected and confirmed cases of active pulmonary tuberculosis disease.

The data source for this analysis is the 2000 - 2002 summary TB screening reports. Counts of confirmed active cases of TB were extracted from the Naval Disease Reporting System. Statistical analyses were used to evaluate differences in TST conversion rates for the various duty stations. Odds ratios were calculated using EpiInfo Version 6 and Cornfield 95% confidence intervals are reported. Finally, reporting percentages were compared against unit strength counts to determine actual reporting compliance percentages. Commands do not stratify their reported data by Marine Corps versus Navy personnel. Therefore, for the purpose of this analysis, a command was classified as Marine Corps or Navy based on it's assigned service obligation and all personnel reported under that command were classified as such.

Results

From 2000 to 2002, 1,417,674 active duty personnel were screened resulting in 15,155 new reactors. Table 1 shows TST conversion rates and number of active TB cases by year. TST conversion rates ranged from 1.33 to 1.58 % throughout the three years. Figure 1 shows the trends in tuberculosis case rates over the past 14 years. Although the number of active TB cases doubled from 2000 to 2001, rates remain fairly stable when broken down by service (Figure 1). Data shows that 69% of active duty cases were Navy while 21% were among Marine Corps personnel. Interestingly, 33% of Marine Corps active TB cases were female as compared to 7% of Navy active TB cases.

Table 2 shows an analysis of TST conversion rates by command type over the three year period. TST conversion rates on Carriers, on Amphibious ships, and among Marine Corps personnel are all significantly lower than that of Military Treatment Facilities (MTF's). In fact, the TST conversion rate among personnel on carriers is 2.7 times lower than TST conversion among MTF personnel. Shipboard personnel are more readily accessible to the medical staff for testing and, once underway, the ship presents as a closed

population minimizing exposure risk. MTF's see a population of personnel who have interaction with a greater number of potentially infected personnel. MTF's are also located in cities or large urban areas in which TB is more common, again increasing risk of exposure to an infected patient.

Figures 2 and 3 illustrate trends in reporting compliance by service and by command type, respectively. Marine Corps reporting compliance has increased by 39% from 2000 to 2002 while Navy reporting compliance apparently decreased. Reporting compliance by vessels remained stable while MTF reporting compliance decreased over time.

Analysis by NEPMU shows regions with the highest percentage testing resulted in the lowest PPD reaction rates (Table 3). Interestingly, there is a 30% testing difference between NEPMU 5 and NEPMU 7 which only resulted in a reactor rate difference of 0.14%. Furthermore, the highest number of new converters and active TB both fall under regions 2 & 5, the areas monitoring the greatest numbers of personnel in urban settings.

Table 1. Summary of Annual TB Reports for 2000 to 2002

Year	Total Personnel Reported	% Tested	New Reactors Identified	TST Conversion Rate (%)	Active Cases
2000	448,425	74.61	4,311	1.33	5
2001	484,698	67.02	6,046	1.54	11
2002	474,551	68.05	4,798	1.58	7

Figure 1. Navy and Marine Corps Active Tuberculosis Case Rate, 1988-2002

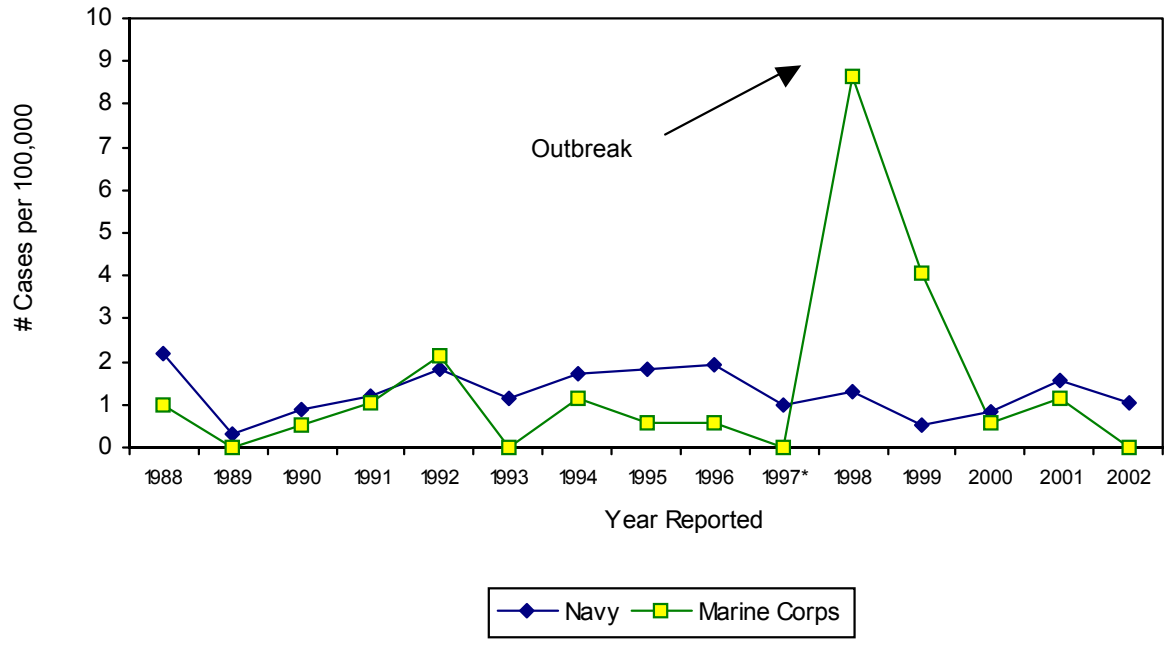

Table 2. Summary Odds Ratios for PPD Conversion 2000-2002

Command Type	% Converted	OR	Lower 95% CI	Upper 95% CI
Carriers	0.60	0.37	0.34	0.41
Amphibious Ships	1.48	0.92	0.85	0.99
US Marine Corps	1.20	0.75	0.71	0.78
MTF's	1.61	1 [REF]	N/A	N/A

Figure 2. USN & USMC Reporting Compliance

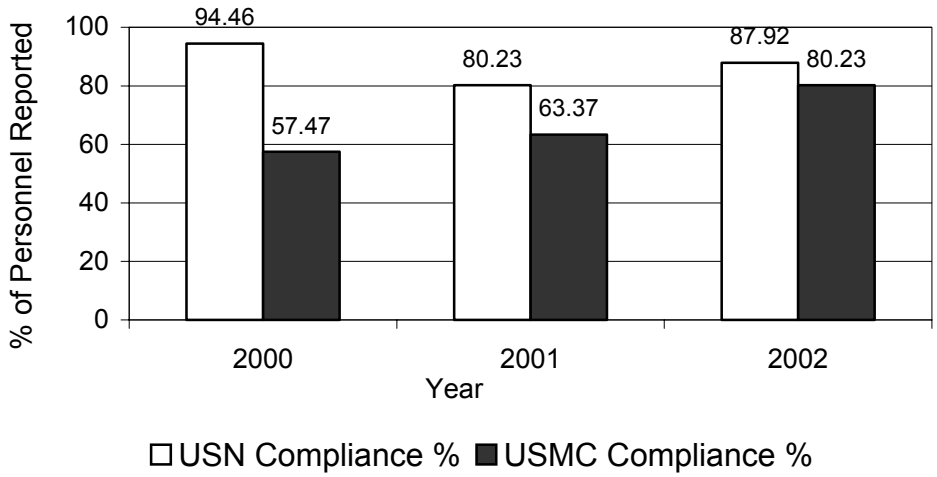

Figure 3. TB Control Program Reporting Compliance by Command Type

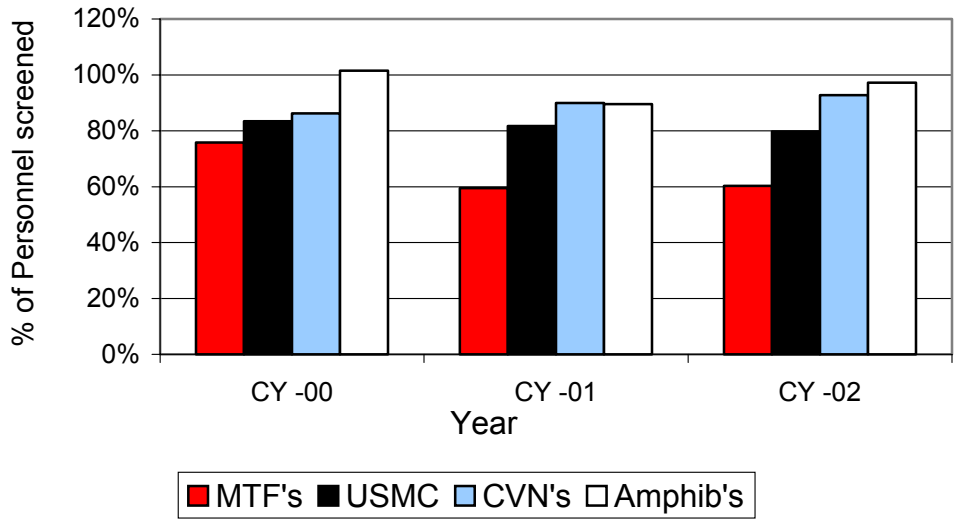

Table 3. Summary of reported statistics from NEPMU's from 2000 to 2003

Reporting Unit	Total Personnel	# Tested	# Identified	# on INH	Old Reactors	% Tested	Reactor Conversion %
NEPMU 2	882083	611206	9067	8730	13841	70.40	1.48
NEPMU 5	359803	250584	3655	2676	9601	71.55	1.46
NEPMU 6	119640	79252	1214	1163	5833	69.64	1.53
NEPMU 7	46148	19605	314	255	1469	43.88	1.60

Discussion

Tuberculosis maintains a steady impact on the US Navy & Marine Corps where surveillance will continue to be of primary importance in preventing outbreaks. Actual compliance for the entire Navy Tuberculosis screening programs is difficult to determine with the current data since units not routinely deploying may only receive TST's triennially vs. operational forces annually. However, reports from commands are expected annually, whether personnel were tested or not. Therefore, reporting compliance is presented in this study. In addition, compliance rates are presented for four command types (Figure 3) which hold risk factors or operational commitments requiring annual testing. Reporting compliance in 2002 reached 87.92% and 80.23% for the Navy and USMC respectively. Rates were notably higher in Navy units augmented by USMC personnel. This is most likely explained by failure to keep separate records for the crew and embarked units. In this analysis, these commands were classified as Navy, entering a bias that likely led to an underestimation of reporting compliance for the USMC. Other occurrences of higher testing rates reflected cases of suspected or actual active tuberculosis disease.

Reviewing summary data for the NEPMU's over the past three years the higher testing rates corresponded directly with lower conversion rates. Active cases of TB were also more common in regions reported by NEPMU 2 & 5, the regions handling the greatest number of personnel. However overall active cases of TB are declining in all areas over the last three years. This may be because of more aggressive testing and treatment. Furthermore, combined USN & USMC rates are still less than one half of the national average. [2]

Vessels may be considered more high risk than MTF's because of the close living quarters and closed ventilation systems. However, hospital workers would be at high risk of exposure because of TB cases presenting for treatment. This study shows that carriers and amphibious ships have a significantly lower conversion rate when compared to MTF's. Further investigation into this finding is warranted. Pertinent questions include: Are conversions being identified during routine annual screening or during TB case investigations? Are suspect TB cases being identified in the MTF or by outside commands? If suspect TB cases are being sent to an MTF, is the MTF aware of the diagnosis?

Results suggest that the increased readiness requirements of Sea Duty commands has consistently demonstrated better testing and better reporting possibly resulting in lower conversion rates among those commands. It is surprising that a difference of 26% in testing compliance between the highest and lowest NEPMU regions only demonstrated a 0.14% difference in TST conversion. It is concerning, however, that military healthcare facilities have fallen short of their preventive medicine responsibilities with only 57% of Navy MTF personnel being tested in 2002. Further evaluation of TB control programs and surveillance may be needed to help MTF's meet the new proposed OSHA guidelines.[3]

Acknowledgements

I would like to take this opportunity to send thanks to all the personnel who proved helpful in putting this paper together: HM1(SW/AW) Isaiah Corbin, USN for assembling the CY 2000 report; Ms. Tamara Telfair, MPH for the CY 2001 report and a previous retrospective; and Ms. Diana Gilchrist, RN for technical support.

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Vaccine Adverse Event Reporting System (VAERS) Update

Table 1 displays the total Anthrax VAERS reports submitted by each service to the Army Medical Surveillance Activity through 31 Dec 2003 in support of the Anthrax Vaccine Immunization Program. Reactions are classified per DoD Memorandum 15 October 1999, Policy for Reporting Adverse Events Associated with the Anthrax Vaccine. Table 2 displays all VAERS reports, by vaccine type, submitted to NEHC through 31 Dec 2003. Reactions are classified using adverse event guidelines of the Centers for Disease Control and Prevention.

Table 1. Anthrax Vaccine Immunization Program VAERS Cumulative Data by Service (28 Aug 1998 - 31 Dec 2003)

Service	Classification				Cum. Totals
	Local Reaction			Systemic Reaction	
	Mild	Moderate	Severe		
USA	22	32	14	79	147
USN	8	16	11	64	99
USAF	36	78	53	400	567
USMC	1	13	3	20	37
USCG	0	1	0	0	1

Note: Excludes 4 VAERS Reports on Anthrax and Non-DoD Reports.

Table 2. Navy and Marine Corps VAERS Cumulative Data by Vaccine Type (01 Dec 2002 - 26 Sept 2003)

Vaccination/Event	Classification		Cum. Totals
	Serious*	Non-serious*	
Anthrax	1	34	35
Smallpox	6	91	97
Anthrax + Smallpox	3	9	12
Other	0	10	10
Cum. Totals	10	144	154

* CDC defines serious adverse events as death, life-threatening illness, hospitalization or prolongation of hospitalization, or permanent disability. A non-serious adverse event then includes any other adverse event reported (<http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5201a1.htm>)

NAVAL DISEASE REPORTING SYSTEM (NDRS)

Summary of 2003 Data

Tables 1 and 2 display the Medical Event Reports (MERs) received at Navy Environmental Health Center (NEHC). Interested readers may calculate rates among Active Duty by dividing the

Table 1. ACTIVE DUTY Reportable Medical Events, Navy & Marine Corps, Case Frequencies, 01 Jan – 31 Dec 2003

Disease	Total	USN	USMC	Disease	Total	USN	USMC
Amebiasis*	0	0	0	Lyme Disease	12	3	9
Anthrax*	0	0	0	Malaria (specify type) *	86	5	81**
Biological warfare agent exposure	0	0	0	Measles*	0	0	0
Bites, rabies vaccine & human rabies IG	48	20	28	Meningitis (aseptic, viral)	45	29	16
Bites, venomous animal	6	3	3	Meningitis (bacterial other than Meningococcus)	1	0	1
Botulism*	0	0	0	Meningococcal disease*	5	3	2
Brucellosis	0	0	0	Mumps	0	0	0
Campylobacteriosis*	4	3	1	Occupational exposure to blood borne pathogens	0	0	0
Carbon Monoxide poisoning*	0	0	0	Onchocerciasis	0	0	0
Chemical warfare agent exposure	0	0	0	Pertussis*	0	0	0
Chlamydia	2196	1404	792	Plague*	0	0	0
Cholera	0	0	0	Pneumococcal pneumonia	0	0	0
Coccidioidomycosis	12	10	2	Poliomyelitis*	0	0	0
Cold injuries	0	0	0	Psittacosis (Ornithosis)	0	0	0
Cryptosporidiosis*	1	1	0	Q Fever*	0	0	0
Cyclospora*	0	0	0	Rabies, clinical human*	0	0	0
Dengue fever*	0	0	0	Relapsing fever	0	0	0
Diphtheria	0	0	0	Rheumatic fever	1	0	1
E. Coli 0157:H7 infection*	2	1	1	Rift Valley fever	0	0	0
Ehrlichiosis	0	0	0	Rocky-Mountain Spotted Fever	0	0	0
Encephalitis*	0	0	0	Rubella*	0	0	0
Filariasis	0	0	0	Salmonellosis*	17	7	10
Giardiasis	8	4	4	Schistosomiasis	0	0	0
Gonorrhea	432	246	186	Shigellosis*	6	6	0
Haemophilus influenza, type b	0	0	0	Smallpox*	0	0	0
Hantavirus infection*	0	0	0	Streptococcal disease, Group A	4	1	3
Heat injuries	188	17	171	Syphilis	19	15	4
Hemorrhagic fever*	0	0	0	Tetanus	0	0	0
Hepatitis, A (acute, symptomatic only)	1	1	0	Toxic shock syndrome	0	0	0
Hepatitis, B (acute, symptomatic only)	6	2	4	Trichinosis	0	0	0
Hepatitis, C (acute, symptomatic only)	9	8	1	Trypanosomiasis	0	0	0
Influenza (confirmed)	3	2	1	Tuberculosis, pulmonary active*	4	4	0
Lead poisoning	0	0	0	Tularemia*	0	0	0
Legionellosis*	0	0	0	Typhoid fever*	0	0	0
Leishmaniasis	6	0	6	Typhus*	1	0	1
Leprosy (Hansen's disease)	0	0	0	Urethritis (non gonococcal)	149	60	89
Leptospirosis*	0	0	0	Varicella	8	7	1
Listeriosis	0	0	0	Yellow fever	0	0	0

* Reportable with in 24 hours

** Estimate based on Liberia Outbreak.

Data in the NMSR are provisional, based on reports and other sources of data available to the Navy Environmental Health Center. MERs are classified by date of report. Only cases submitted as confirmed are included.

frequencies by estimated mid-year strength of 380,799 for USN and 179,722 for USMC. Table 1 shows Active Duty only. Table 2 shows non-Active Duty Beneficiaries.

Table 2. BENEFICIARIES Reportable Medical Events, Navy & Marine Corps, Case Frequencies, 1 Jan –31 Dec 2003

Disease	Total	USN	USMC	Disease	Total	USN	USMC
Amebiasis*	0	0	0	Lyme Disease	1	1	0
Anthrax*	0	0	0	Malaria (specify type) *	0	0	0
Biological warfare agent exposure	0	0	0	Measles*	0	0	0
Bites, rabies vaccine & human rabies IG	136	48	88	Meningitis (aseptic, viral)	58	49	9
Bites, venomous animal	0	0	0	Meningitis (bacterial other than Meningococcus)	4	4	0
Botulism*	0	0	0	Meningococcal disease*	1	1	0
Brucellosis	0	0	0	Mumps	0	0	0
Campylobacteriosis*	3	2	1	Occupational exposure to blood borne pathogens	0	0	0
Carbon Monoxide poisoning*	0	0	0	Onchocerciasis	0	0	0
Chemical warfare agent exposure	0	0	0	Pertussis*	6	6	0
Chlamydia	716	426	290	Plague*	0	0	0
Cholera	0	0	0	Pneumococcal pneumonia	9	8	1
Coccidioidomycosis	9	8	1	Poliomyelitis*	0	0	0
Cold injuries	0	0	0	Psittacosis (Ornithosis)	0	0	0
Cryptosporidiosis*	0	0	0	Q Fever*	0	0	0
Cyclospora*	0	0	0	Rabies, clinical human*	0	0	0
Dengue fever*	1	1	0	Relapsing fever	0	0	0
Diphtheria	0	0	0	Rift Valley fever	0	0	0
E. Coli 0157:H7 infection*	1	1	0	Rocky-Mountain Spotted Fever	0	0	0
Ehrlichiosis	0	0	0	Rubella*	1	1	0
Encephalitis*	0	0	0	Salmonellosis*	77	51	26
Filariasis	0	0	0	Schistosomiasis	0	0	0
Giardiasis	13	10	3	Shigellosis*	47	39	8
Gonorrhea	76	59	17	Smallpox*	0	0	0
Haemophilus influenza, type b	1	1	0	Streptococcal disease, Group A	6	6	0
Hantavirus infection*	0	0	0	Syphilis	10	9	1
Heat injuries	3	1	2	Tetanus	0	0	0
Hemorrhagic fever*	0	0	0	Toxic shock syndrome	0	0	0
Hepatitis, A (acute, symptomatic only)	0	0	0	Trichinosis	0	0	0
Hepatitis, B (acute, symptomatic only)	8	8	0	Trypanosomiasis	0	0	0
Hepatitis, C (acute, symptomatic only)	2	2	0	Tuberculosis, pulmonary active*	4	3	1
Influenza (confirmed)	9	9	0	Tularemia*	0	0	0
Lead poisoning	0	0	0	Typhoid fever*	0	0	0
Legionellosis*	1	1	0	Typhus*	0	0	0
Leishmaniasis	0	0	0	Urethritis (non gonococcal)	0	0	0
Leprosy (Hansen's disease)	0	0	0	Yellow fever*	0	0	0
Leptospirosis*	0	0	0				
Listeriosis	0	0	0				

* Reportable within 24 hours

Prevention Metrics and Health Trend Report Fiscal Year 2003 - USNH Yokosuka

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The Department of Health Guidance at USNH Yokosuka is dedicated to improving the morbidity patterns, health status and health care behavior of the Yokosuka Naval Community. A variety of individual, organizational and cultural interventions are used to optimize the health of the population we serve. This is accomplished by utilizing an evidence-based system that involves risk assessment, targeting, intervention, tracking, and outcome analysis. Reported below are select FY03 metrics and accomplishments.

The Department of Health Guidance consists of the divisions of Health Promotion (HP) and the Preventive Heath Assessment (PHA). Through integration and optimization, the Health Guidance has seen an impressive increase in clinic visits (CHCS data) through the past 4 fiscal years (Figure 1). In FY03, there were 5026 total visits (HP=2909, PHA=2117). Active Duty personnel comprised the majority of this workload (81%) followed by Family Members (15%). Of the 2117 PHA visits, 80.3% completed Health Risk Assessments (HRA). Table 1 shows various health related characteristics identified in the HRAs. This was an active duty population.

In FY03, the 2909 HP intervention contacts included targeted email education, 1 on 1 education/ counseling, or group counseling. All contacts were Active Duty service members. Programs included lifestyle enhancement for weight, cholesterol, stress and blood pressure control, fitness, diabetes, and tobacco cessation. Figure 2 indicates a possible shift from high-risk categories to lower risk categories among HP intervention contacts. Figure 3 shows additional data on the impact of FY03 interventions for participating patients. Figure 4 shows the top five rankings of how the population preferred to view their health promotion information in FY03. Finally, Figure 5 shows the top ten requested worksite Health Promotion seminars.

Figure 1. Distribution of Clinic Visit Over Time

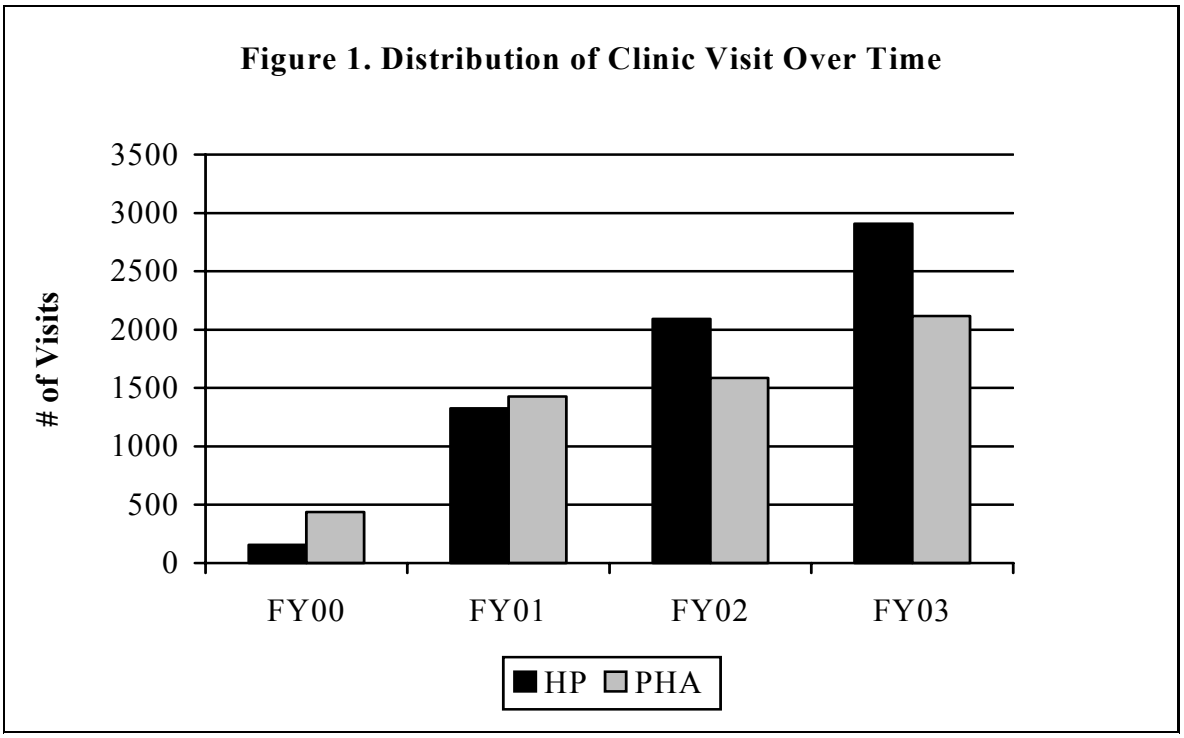

Table 1. HRA Health Related Characteristics Identified in Active Duty Population for FY03. (n=1700)

Characteristic	%
Chronic Disease/Condition:	
Hypertension	6%
Asthma	2%
Kidney Disease	1%
Cardiovascular Disease	1%
Depression	1%
Diabetes	1%
Psychological Perception	
Anxious/Depression	16%
Poor Life Satisfaction	13%
High Stress	9%
Poor Physical Health	6%
Bio/Physiological Risk Factors	
High Systolic Reading (>139)	20%
High Diastolic Reading (>89)	10%
LDL >129	38%
HDL < 40	20%
OverWeight/Obese	61%
Obese	20%
Lifestyle Habits	
Tobacco Use	24%
Sedentary	34%
Medication/Drug Usage (>3 prescription drugs)	5%
High Alcohol Usage	4%
No Seat Belt Usage	4%

Figure 2. Pre and Post Intervention Distribution of Acive Duty Patients by Risk Category for Various Health Promotion Programs

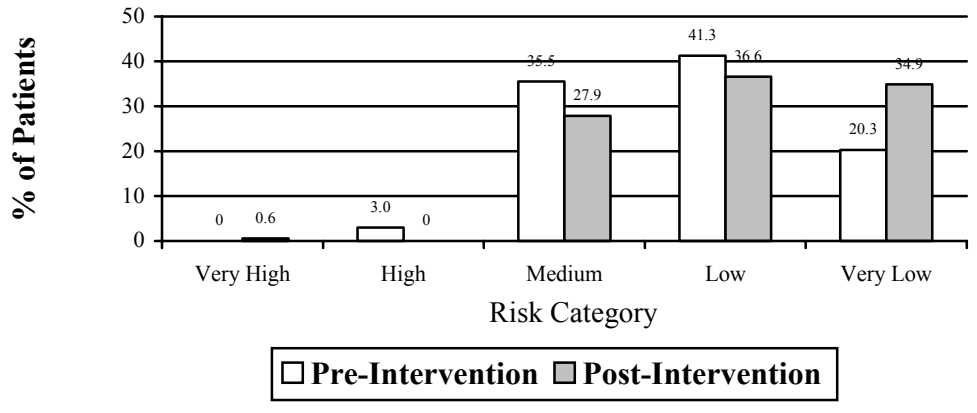

Figure 3. Impact Data Analysis for Various Health Promotion Programs, Active Duty Service members

- 11% Improved their CHD Risk status*
- 24% Improved their Cancer Risk status*
- 15% Improved their Osteoporosis Risk status*
- 42% Improved their overall nutrition status*
- 31% Improved their overall fitness status*
- 15% Improved their weight status*
- 23% Improved their cardiovascular fitness status*
- 7% Improved their sleep status (7-8 hours per day)*
- 55% Tobacco Quit Rate**
- 72% Tobacco cessation participation **

* Based on 4 Month F/U
**Based on 6 Month F/U DOD/VA guideline

Figure 4. Top Five Preferred Vehicles for Education by Active Duty Service members (n=1672)

1. E-mail Counseling (40%)
2. Internet websites (32%)
3. Brochures, pamphlets, newsletters (29%)
4. 1 on 1 Counseling (24%)
5. Seminars (20%)

Figure 5. Top Ten Requested Worksite Health Promotion Seminars by Active Duty Service members (n=1672)

1. Fitness Improvement (42%)
2. Nutrition Improvement (30%)
3. Weight Loss (26%)
4. Stress Reduction (22%)
5. Cholesterol Reduction (20%)
6. Supplements (16%)
7. Men's and Women's Health (15%)
8. Sports Injury Prevention (14%)
9. Healthy Back Care (13%)
10. Quit Smoking (12%)

Malaria Among Deployed Marines in Liberia, Aug-Sep 2003

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Introduction

In July 2003, as part of an assignment to support peacekeeping operations in Liberia, approximately 160 Marines were deployed as a quick reaction force and positioned at Roberts International Airfield (RIA). Most spent 10 days ashore beginning on 14 Aug 2003. On 26 Aug 2003, the first of a number of Marines aboard Ship A reported to sick call with complaints of headache, fever, and gastrointestinal upset including diarrhea. During this time, the diagnosis of malaria was entertained, but not confirmed and the Marines' symptoms resolved with treatment. On 05 Sep, two Marines became acutely ill with fever and were evacuated that same day. 0n 06 Sep, a large number of Marines reported for medical attention after self-treating for headache, fever, and gastrointestinal symptoms including diarrhea. At this point the medical officer sought help from the medical staff aboard Ship B, and 33 Marines were medevaced. The assistance of a medical epidemiologist was requested, and the epidemiologist arrived on 08 Sep when the last group of 10 Marines was medevaced. This write-up is a summary of the epidemiologic investigation.

For the purpose of this analysis, confirmed and suspect malaria cases were counted. In addition, results of the computerized survey reported here did not include responses from medevaced personnel because of insufficient time.

Initial Investigation

Initial attention was focused on RIA, where most of the cases were concentrated, and on Unit #1c which contained the largest number of cases. A breakdown of cases by Unit is provided in Figure 1. Data suggests that the problem is concentrated in personnel positioned at RIA and that among personnel at RIA the problem is concentrated in Unit #1c. This analysis assumes that these groups were similarly at risk for contracting malaria.

Given the Anophelene mosquitoes' strong predilection for nighttime feeding, an attempt was made to produce rates based on exposure. Rates were adjusted in two ways: (1) to adjust for the many personnel who went ashore for short trips that did not involve overnight stay, a day trip ashore was assigned half the value of a day and night trip ashore and (2) to adjust for the fact that once someone contracts malaria, that person is no longer at risk for contracting malaria, cases are given credit for half their days ashore in the at-risk category. Figure 2 shows the distribution of the adjusted rates by Unit.

Unlike the other units, Unit 2 personnel spent the majority of their time at the embassy, to include overnight stays. The embassy afforded a more protected environment from mosquitoes. Data shows that not only does Unit 1c have more cases than other units combined but also more man-days ashore. Results suggest that Liberia, due to an abundance of standing water, at least during the rainy season, presents a fairly uniform malaria risk and that the primary risk factor for contracting malaria is time spent in the malarious environment.

Personal Protective Measures in the Field

A computerized survey of 290 MEU personnel who went ashore for varying periods of time was conducted to evaluate use of personal protective measures during deployment. This analysis in-

cludes those personnel who were maintained aboard ship, some of whom became ill with confirmed or suspected malaria. There was insufficient time to incorporate responses from medevaced personnel.

Deet Use

The MEU purchased supplies of DEET and issued DEET to the troops. Many troops were required to pass two separate inspections in which they showed that they had their issued containers. Despite this, use of DEET was sporadic at best, even though the majority of personnel who stayed ashore overnight were aware of being bitten. Figure 3 shows the relative proportions of people who used insect repellent at least once. The Figure shows that very few people used DEET regularly, however there appears to be substantial gains from applying DEET even once a day (RR=2.42).

Even among personnel who did use repellent, use was sporadic. Most did not apply repellent even once per day. Although they had been issued DEET cream from the supply system, a microencapsulated, time release formulation that has lower odor, less greasiness, and longer protection endurance than any liquid formulation, most personnel who used any repellent chose brand name products such as OFF or Deep Woods OFF in favor of the superior supply system product (Figure 4).In Figure 4, the Other DEET category represents DEET-containing products such as OFF and Cutter's. The Non-DEET category includes anything such as Avon Skin-So-Soft that has been mythologized to have insect repellent properties.

Permethrin

The command had great difficulty in obtaining permethrin uniform treatment prior to deploying. Two options that were explored were (1) having the base laundry wash the Marines' camis using permethrin in the wash cycle or (2) spraying camis with permethrin concentrate. After much effort, at a late date, the command ordered permethrin in individual cans which reportedly arrived on 03 Mar 03, two days before the MEU deployed. The cans were issued to the troops, but aboard ship it was very difficult to spray. Desert cami uniforms were sprayed before the Marines went to Iraq in late May, but there was no unit-wide spraying after that. Although some Marines had sprayed a set of woodlands, most troops apparently did not. While desert camis were worn in Iraq, the Marines switched to woodlands when deployed to Liberia. Figure 5 shows the proportions of troops wearing permethrin treated woodland camis ashore in Liberia.

Among the few personnel who had permethrin impregnated woodland camis, many had camis that had received more than the recommended number of washings for spray can treated uniforms.

The Uniform as Barrier

Although the uniform is an excellent barrier against biting mosquitoes even without permethrin impregnation, almost nobody wore them during sleep. The troops reported significant difficulty sleeping due to high temperature and humidity at night and so opted to sleep relatively unclothed. Figure 6 below shows the sleep attire used ashore. Many people did different things on different nights; the survey asked respondents to indicate all choices that reasonably approximated what they wore during sleep. Figure 6 shows the frequencies of individual choices in sleeping attire affording most exposure to biting mosquitoes. If a respondent checked multiple answers, only the option affording the least mosquito protection is presented in the chart. It is unclear why some units had high rates of no response. Risk estimates were not meaningful because very few troops reported sleeping in uniform the entire time of exposure.

Mefloquine Compliance

Compliance with Mefloquine chemoprophylaxis was unquestionably the most strictly adhered to arm of the vectorborne disease prevention program. Figure 7 shows the number of personnel who reported all doses on the scheduled day, late doses, and skipped doses.

Directly Observed Therapy [DOT] was employed by the command, although the method of implementation varied. Some units, e.g. Unit 1c, did DOT in company-wide formations; others administered DOT by the Corpsmen at the squad level. Some Corpsmen even had the Marines initial a roster testifying that they had received their antimalarial pills. Some parts of the command element did not do DOT as they had small numbers of personnel in numerous places. Relative risk estimates are not reported because of the many factors in chemoprophylactic use and absorption.

Bednet use

The Quick Reaction Force [QRF] was comprised mostly of personnel from Unit 1c and was positioned at Roberts International Airport. The initial plan was for Unit 1c to be ashore for 72 hours. The decision was made to travel light, relying on what each Marine could carry on his back. In order to minimize backpack weight, Lima Battery did not take their screened two-man tents. After one night ashore, Unit 1c did request cots, which were sent ashore to them. However, 1c did not request bednets; as a matter of policy of not pushing forward gear that a line unit has not requested, bednets were not sent along with the cots. The initial 72 hour planned stay ashore was gradually extended in small increments until finally, after 10 days ashore, the QRF reembarked.

Figure 1. Malaria Crude Rates By Unit

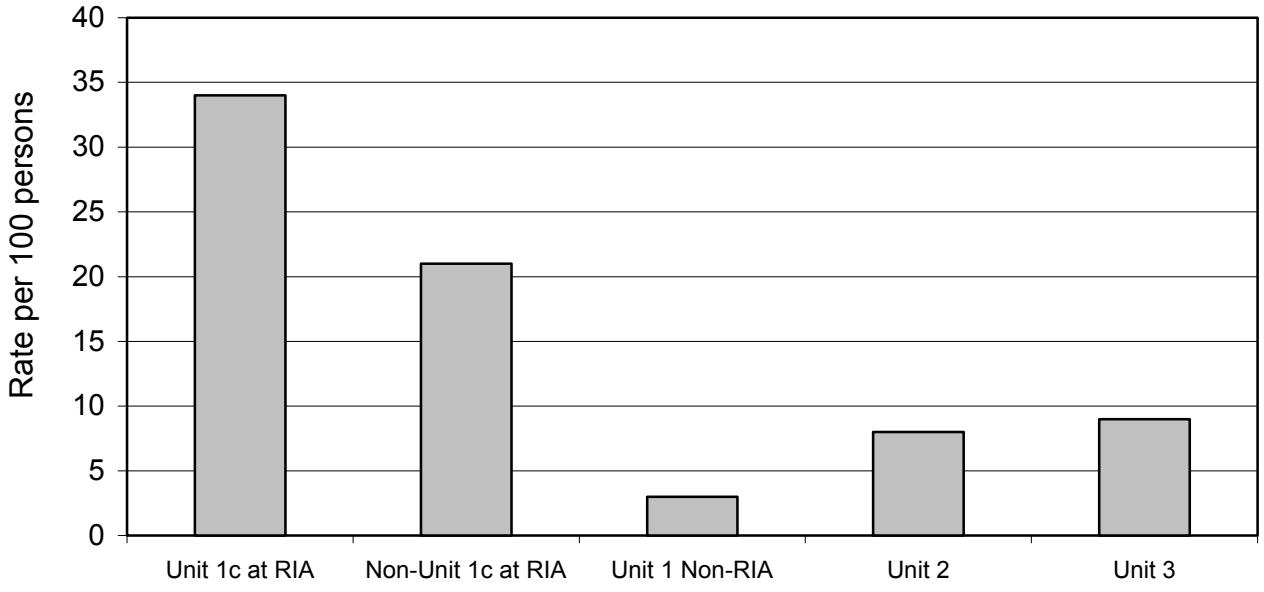


Figure 2. Cases per Adjusted 100 Man-days Ashore

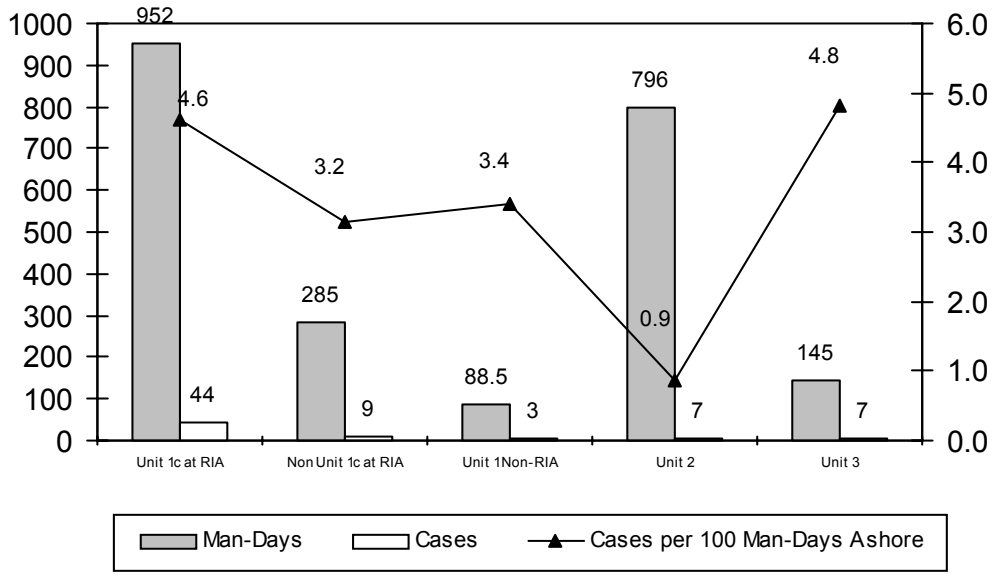


Figure 3. Deet Use

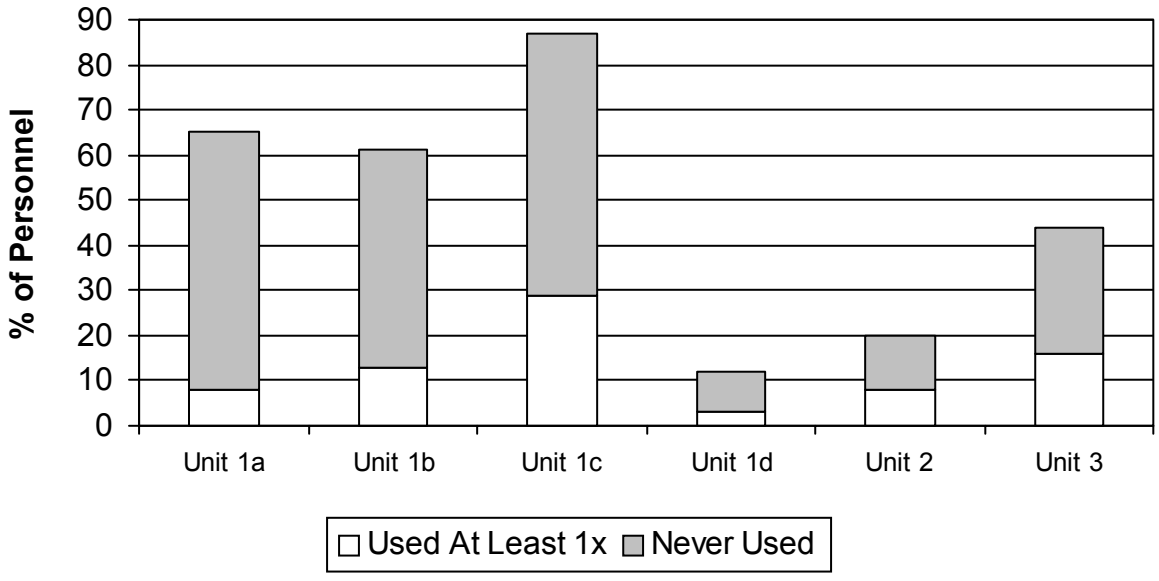


Figure 4. Repellent Type Used by Personnel who Used Repellent at Least Once

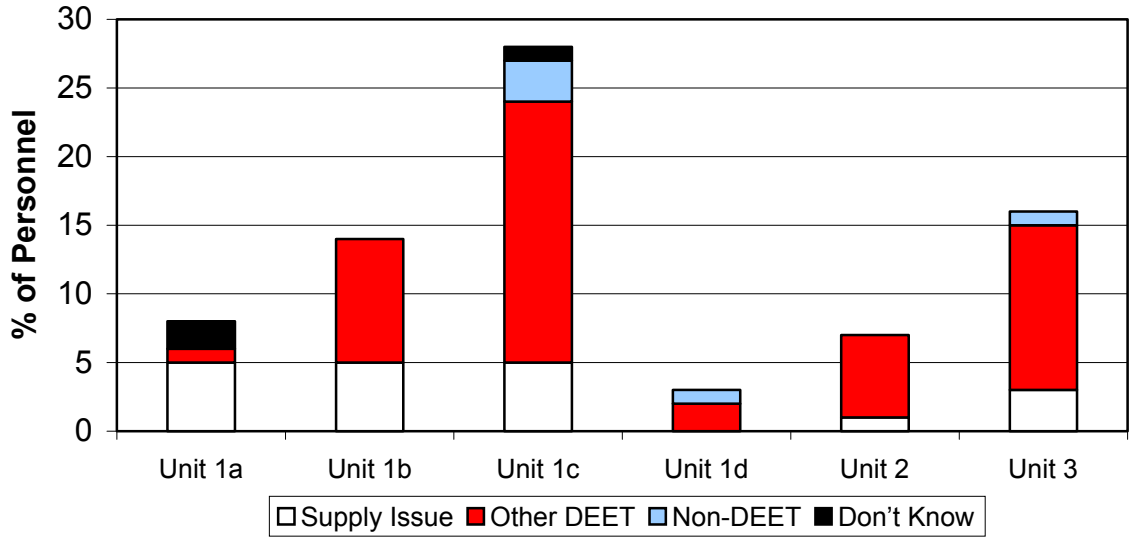


Figure 5. Permethrin Treated Camis In Liberia

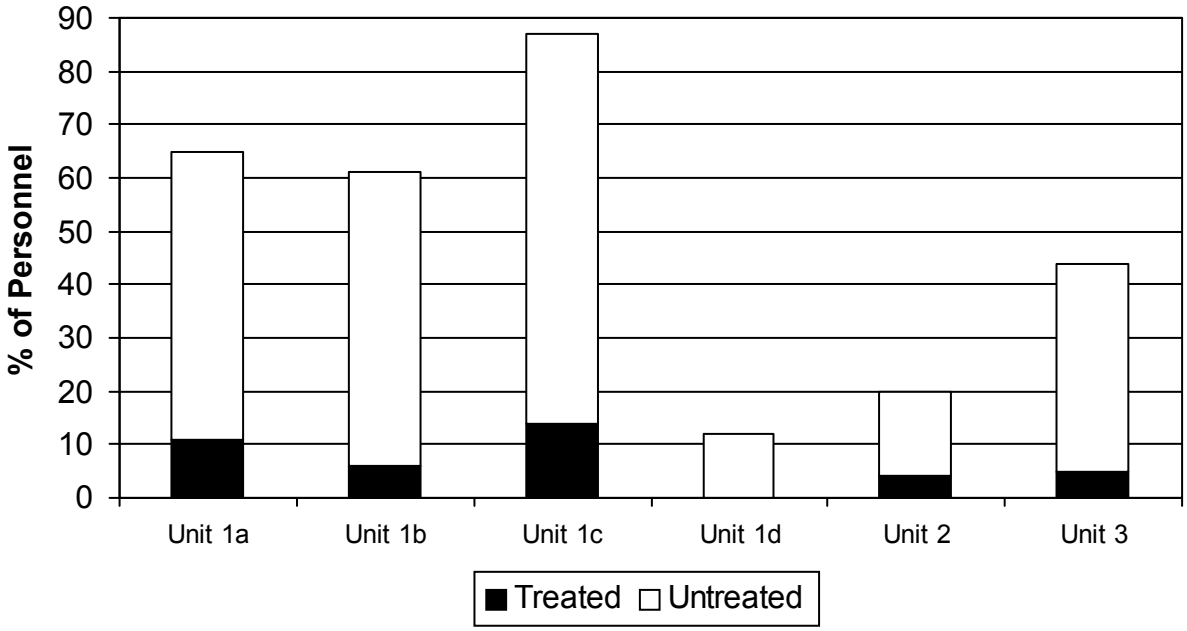


Figure 6. Worst Exposure Sleep Attire By Number of Personnel

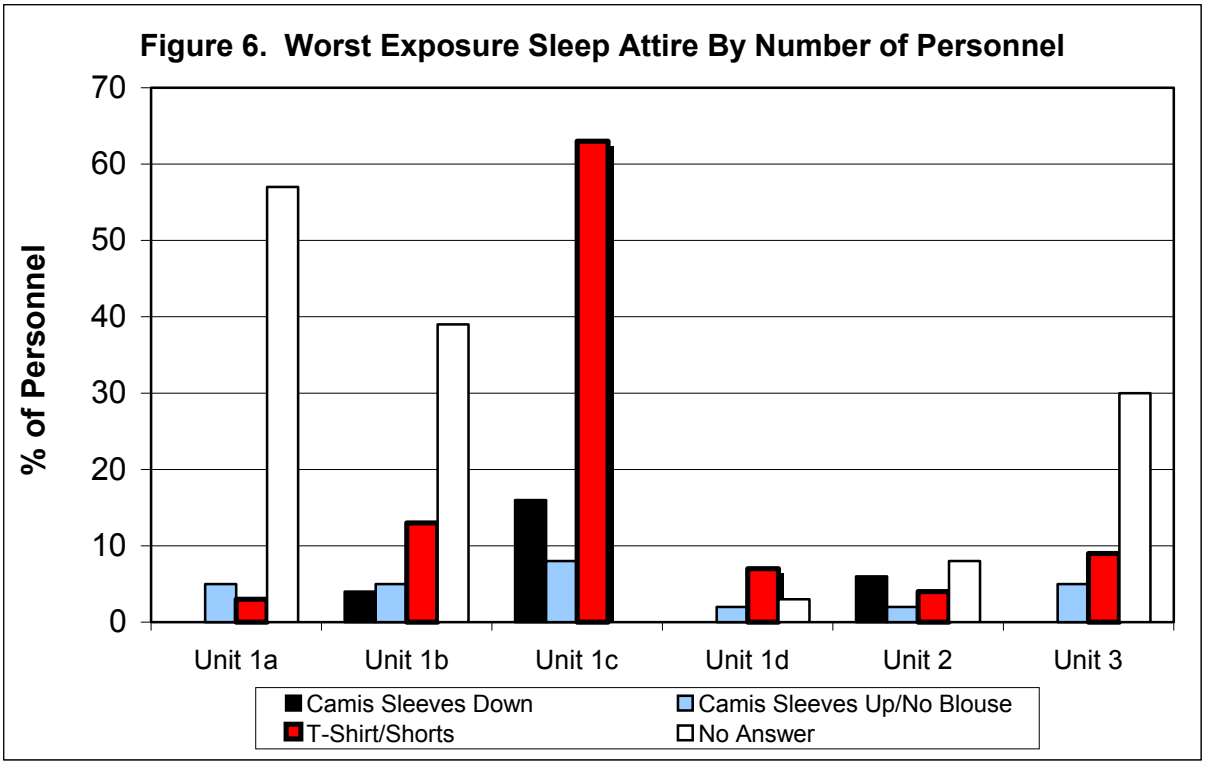
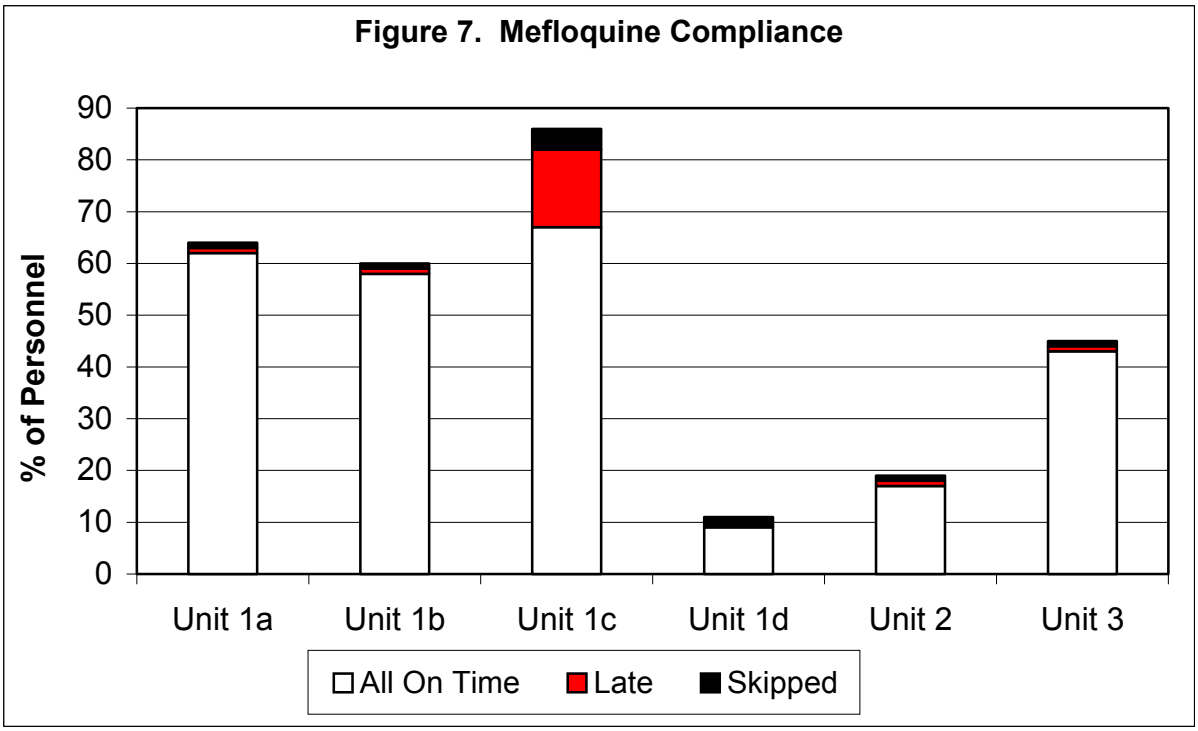


Figure 7. Mefloquine Compliance



Conclusions/Recommendations

1. It seems clear that the average troop in the unit took the malaria threat somewhat seriously; else mefloquine compliance would be expected to be lower. Unfortunately, it seems that the average troop thought that taking mefloquine was all he needed to do. Over-reliance on chemoprophylaxis is associated with the distinct disadvantage of promoting Mefloquine resistance as mosquitoes are presented little or no barriers to feeding on blood that contains the anti-malarial. Chemoprophylaxis should be viewed as the last arm of a comprehensive program, one that presents a final barrier to illness after the barriers of uniform, DEET, permethrin, and possibly also bednets have been bypassed by the malaria bearing mosquito.

2. That troops prefer to go out and purchase an inferior insect repellent when they are given a superior insect repellent free of charge indicates a marketing failure on the part of the medical department and possibly the command in general. Repellent use is an arm of our vector borne disease prevention program for which “buy-in” at the level of the junior troop is essential, and without such buy-in will never be uniformly employed. Effort should be exerted to educate troops on the superiority of the product offered free of charge from within the supply system in terms of odor, greasiness, endurance of effect, and lower corrosiveness to plastics such as, importantly, prescription lenses.

3. Units need help obtaining permethrin treatment for uniforms. Give local preventive medicine personnel responsibility for assisting operational units to achieve compliance with the vector borne disease prevention program and to locate resources to accomplish this mission.

4. Prevention of vector borne disease must be a line program. Even absent new uniforms made of engineered fabrics that are more comfortable in hot, humid environments, the command must discipline troops to employ the uniform as the barrier to disease bearing mosquitoes and other vectors.

5.The medical staff were hampered by lack of experience in detecting acute malaria in deployed troops. Also, aboard Ship B, the lab techs only felt comfortable in identifying the young, ring form trophozoite of the malaria plasmodium; they may well have reported false negatives due to this weakness. Navy Medicine should push tropical medicine education out to operational forces. This may mean taking education to them rather than forcing operational physicians to come to the educators.

6. Giemsa stain for blood parasites is not a required stain for shipboard laboratories to stock. This forced the lab techs aboard Ship B to use Wright’s stain for blood smears, an inferior stain for viewing blood parasites. This lack may have contributed to the difficulty in confirming malaria in ill personnel. Regulations governing shipboard laboratories should include Giemsa as a standard, required stock item. Additionally, lab techs should be given periodic refreshers in staining blood smears, with Giemsa, so that they may be read by an informed medical officer or by the lab techs themselves.

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